Milk from indigenous sheep breeds: An adaptation approach to climate change by women in Isinya, Kajiado County in Kenya

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Summary

Changing climatic conditions in Eastern Africa with extreme weather events such as droughts and floods have resulted in massive losses of cattle and exotic and crossbred sheep breeds kept in pastoral communities. This has led to an increased demand for more resilient breeds, and the use of alternative livestock products previously ignored by the communities. This study presents an adaptation by women in Maasai pastoral communities in response to the changing climatic conditions. Following two years of droughts with huge losses of animals in Kenya, Maasai women in Isinya began to milk their sheep for the upkeep of their households. The emergence of the product resulted in a business enterprise through which the women could generate an income from sale of sheep milk to a processor who produced cheese for export. Interventions to support product handling to ensure quality of the milk were put in place. Fluctuating volumes and seasonality in supply of the product however remain as challenges. There is a demand for improved indigenous sheep as they continue lactating through dry environmental conditions for the upkeep of their offspring. Efforts to develop the capacity of the communities on disease prevention, pasture and water management would greatly improve offtake and increase incomes from indigenous sheep.

Background

The paradox of livestock production in developing countries is that livestock contribute to, and are also victims of climate change (FAO, 2009). Unfortunately, climatic conditions are changing, with potentially devastating impacts in East Africa because of drastic changes in the frequency, intensity, and predictability of precipitation (IPCC, 2001). The increased frequency of extreme weather events, notably floods and droughts may overwhelm the resilience of pastoral systems and keep the communities in a perennial state of "recovery" from one drought to another. Without more resilient species and breeds, populations of livestock within the arid and semi-arid lands (ASAL) cannot stabilize, and the condition of animals in herds and flocks will continue to deteriorate.

Sheep are an important livestock species reared in the ASAL. Their shorter generation intervals and relatively higher reproductive rates among the ruminant livestock reared make them a key asset to pastoralists. In many countries, sheep fulfill multipurpose roles (i.e. produce wool, meat, milk and mow the landscapes) (Pollott and Gootwine, 2001), however in pastoral systems of Kenya, sheep are mainly kept for meat, manure and skins (Kosgey, 2004). In Maasai pastoral communities, sheep are often the only livestock asset over which women and youth have a greater control. The breeds kept in extensive systems in Kenya include trans-boundary breed groups such as

Picture 1. Flock of mainly Red Maasai sheep in Isinya

the East African fat tailed sheep of which the Red Maasai are a representative group (Picture 1). Red Maasai sheep inherently resist intestinal worm parasite infestation and infection (Baker et al., 2004), and are tolerant to drought conditions (Kosgey et al., 2008).

In Kenya, past sheep improvement programs mainly focused on crossbreeding of indigenous breeds with exotic breed types, especially the Dorper breed. The crossbreeding results in faster growing animals with more evenly distributed fat than what is found in the indigenous breeds. However, studies on the breeds show that the Dorper and some crossbreds are less productive and unable to tolerate the long droughts in the ASAL (Baker et al, 2003; Okeyo and Baker 2005). During a drought in the Southern rangelands of Kenya in 2008-2009, a large proportion (>50%) of Dorper sheep and their crosses died (Picture 2). One pastoralist lost almost 50% of his 600 sheep flock (Personal communication, Moses Munyangai).

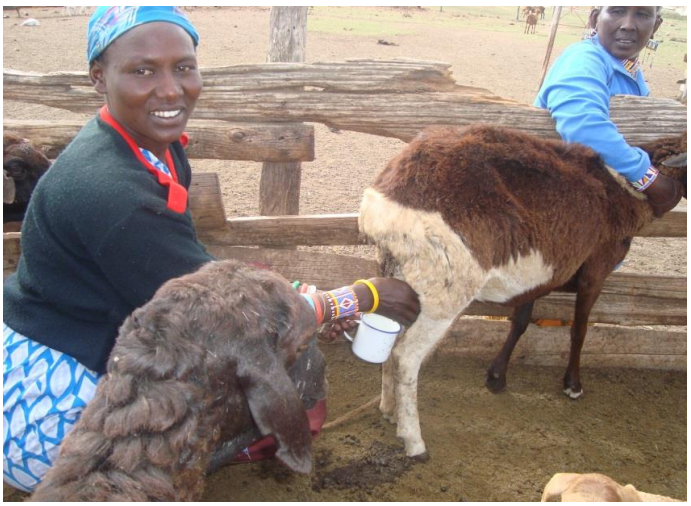
In 2011, ILRI in collaboration with the Swedish University of Agricultural Sciences (SLU) selected a group of pastoral livestock keepers in two sites of Kajiado County; Isinya (10 households) and Amboseli (17 households) to pilot a sheep performance recording and monitoring system aimed at increasing rangeland productivity, and improving the livelihoods and food and nutrition security among pastoralists. Animal performance records and various management decisions made by the pastoral livestock keepers in selecting and culling of their sheep served as a basis for a community based breeding program in the two sites. Details on the characteristics of the pastoral communities involved in the study are outlined by Zonabend et al. 2014. Briefly, livestock keepers were required to have either a pure-bred flock of Red Maasai sheep, or to maintain a flock of both Red Maasai and Dorper sheep and their crosses. These breeds were targeted because of the increasing desire of the Maasai communities to reintroduce Red Maasai sheep in their flocks following droughts that caused massive loses of cattle and exotic sheep that had become popular in the ASAL. Efforts were also made to develop and strengthen the capacity of the pastoral communities, specifically in breeding and improvement programs, flock management, and on the markets and opportunities for marketing quality sheep and sheep products. This study illustrates how the women of Maasai pastoral communities in Isinya adopted an alternative product - sheep milk, in response to the changing climatic conditions of the ASAL to sustain their families.

Picture 2. Pile of bones of animals that died in a drought from a Pastoral livestock keeper's herd

Gender specific products from sheep population

Monitoring of animal growth and the factors affecting animal survival in the area revealed that early each morning prior to the sheep being released to graze, the women would milk the ewes with suckling lambs (Picture 3). Milking sheep was not a practice in the Maasai community. However since most of their cows died from drought related causes, the pastoral women opted to milk select ewes which had larger and better developed udders. In keeping with their tradition, the men do not milk the ewes, but readily consumed the milk harvested.

In 2013, an entrepreneur interested in sheep milk, was introduced to the “lead” pastoral livestock keeper in the ILRI-SLU project site of Isinya. The new market for sheep milk provided an opportunity for the women to increase their income and improve their livelihoods. The women came together and supplied sheep milk to the entrepreneur. Initially (in January 2013), 15 litres of sheep milk were collected daily by 3 women and sold. Later that year, more women joined the group and were supplying up to 45 litres a day (Figure 1).



Picture 3. Women milking sheep in Isinya

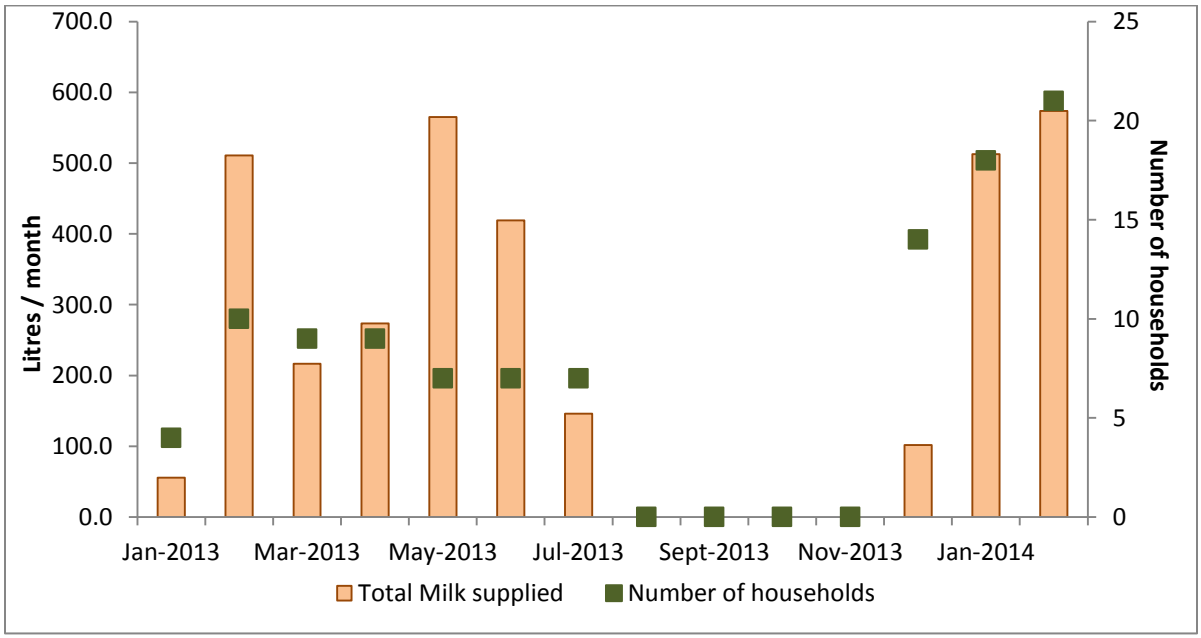


Figure 1: Monthly supply of sheep milk and the number of households selling sheep milk in Isinya

In the area, the price of sheep milk was Ksh.60 per litre (USD.0.67 per litre). The price offered to the women group was Ksh.80 per litre (USD.0.89 per litre). The good price offered by the processor led to a progressive increase in supply, notably in the next lambing season (Figure 1). By January 2014, the women were collecting up to 60 litres per day. The milk collected was used by the processor to produce

manchego cheese for export (**Picture 4**). The milk supply was however not consistent as it depended on the lambing seasons in the area, resulting in extended periods of zero milk supply. As the processor was introducing a new cheese in the market, and with the irregular supply of the milk, there was need to re-evaluate the opportunity and determine the best options for investment in the market.

Picture 4. Manchego Cheese from Sheep milk

The women were permitted to keep and manage the proceeds from the sheep milk. They thus formed an informal cooperative (*Chama*) where every member contributed Ksh.200 (USD. 2.2) weekly from the sales of their sheep milk. On a rotational basis individuals in the "Chama" received the accumulated funds. With this money, they bought household utensils, furnished their living rooms, dressed their children better, bought more food and increased the variety of foods cooked in their houses. Additionally, they were able to support their husbands in paying their children's school fees.

Bulking and quality control measures implemented by group

To facilitate bulking and transportation of milk to the processor, the processor in partnership with a local development company-ABC bought a freezer for milk storage. The women group members rented a room within Isinya town to serve as their operating hub. The milk produced by each group member would be measured, sieved for impurities and tested to ensure it was not adulterated at the team leader's homestead. Once certified to be of good quality, milk would be packed in a clear polythene bag and labelled with the owners' name, then it would be transported to Isinya town for freezing prior to transfer to the processor once a week. Records on volumes of milk supplied by each member, and sale prices received were meticulously kept by the group.

Opportunities for change

The Maasai communities were able to adapt to the extreme changes in the ASAL environment by turning to an alternative product from their sheep to meet their household food and income needs. The sheep milk was well received by the households within the communities and found to be of good nutritional value.

Although the sheep milk production and supply varies greatly within and between the seasons and generally follows the mating cycles of animals, when conditions are very dry, the indigenous breeds of sheep continue lactating albeit to only support their offspring.

Having a market for sheep milk greatly boosted the interest of the community in sheep keeping, and raised awareness on the need to select, keep and carefully manage better milking ewes while paying close attention to their reproduction. The introduction of growth performance recording of the animals through the ILRI-SLU project should include selection and mating of ewes to be used for milk production. There is also need to develop capacity within the communities on disease prevention, pasture and water management in order to improve offtake.

The market for sheep milk is still rudimentary and the end product was for export. Opportunities need to be explored for developing and expanding a local market for sheep milk. This could provide an incentive for pastoral communities to better manage and control their flock sizes and positively contribute to improved environmental management.

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